Measuring the Health of an Invisible Population: Lessons from the Colorado Transgender Health Survey

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BACKGROUND: Transgender people, those whose gender identity does not match their sex assigned at birth, face barriers to receiving health care. These include discrimination, prohibitive cost, and difficulty finding transgender-inclusive providers. As transgender identities are not typically recognized in public health research, the ability to compare the health of the transgender population to the overall population is limited.

OBJECTIVE: The Colorado Transgender Health Survey sought to explore current disparities and their effects on the health of transgender people in Colorado.

DESIGN AND PARTICIPANTS: The Colorado Transgender Health Survey, based on the Behavioral Risk Factor Surveillance System (BRFSS), was developed by the Colorado Department of Public Health and Environment, transgender advocates, and transgender community members. Outreach was targeted to transgender-inclusive events and organizations.

MAIN MEASURES: Responses to the 2014 Colorado Transgender Health Survey were compared side by side to Colorado 2014 BRFSS data.

RESULTS: Results from 406 transgender or gender-nonconforming adults who live in Colorado were included in the analysis. Forty percent of respondents report delaying medical care due to cost, inadequate insurance, and/or fear of discrimination. Respondents report significant mental health concerns, with 43% reporting depression, 36% reporting suicidal thoughts, and 10% attempting suicide in the past year. Respondents with a transgender-inclusive provider were more likely to receive wellness exams (76 versus 48%), less likely to delay care due to discrimination (24 versus 42%), less depressed (38 versus 54%), and less likely to attempt suicide (7 versus 15%) than those without.

CONCLUSIONS: The transgender community in Colorado faces significant disparities, especially around mental health. However, a transgender-inclusive provider is associated with improved mental and physical health and health behaviors. Further population-level research and provider education on transgender health should to be incorporated into national efforts to eliminate health disparities.

KEY WORDS: access to care; community health; cultural competency; disparities; health behavior; transgender; underserved populations.

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INTRODUCTION

Transgender (those whose gender identity is different from their sex assigned at birth) and gender-nonconforming people (those whose appearance, behavior, or other characteristics do not conform to expectations for their gender) face stigma and discrimination. This marginalization is a risk factor for health-risking behavior and poor health outcomes.[1]

Based on limited population data, transgender people are estimated to comprise 0.6% of the US population.[2] Other studies using non-random sampling estimate the size of the transgender population from 0.1 to 2% of the US population.[3] These are likely underestimates due to structural barriers to recognizing identities outside the gender binary, and the reluctance of some transgender people to disclose their identity.[4, 5]

These same challenges limit the amount of health data available on the transgender population. As only two sexes have historically been recognized for data collection, with few exceptions, population-based studies have not included questions on gender identity.[2] In addition, transgender people do not always disclose their identity in healthcare settings. In the 2015 US Transgender Survey, 31% reported that none of their healthcare providers knew they were transgender.[6–8] The lack of inclusion at both the population and healthcare system levels systematically erases transgender individuals from the health care discourse.

While transgender people have been included in larger studies of lesbian, gay, and bisexual people, they face different pressures and have specific physical and mental healthcare needs. The Minority Stress Model suggests that physical and mental health outcomes are negatively affected by repeated discrimination and internalization of social stigma. The impact of ongoing stigma and

discrimination faced by those who hold marginalized identities has a detrimental impact on the overall mental and physical health.[9] Negative health outcomes that are a result of minority stress can also negatively impact other components of an individual's life such as employment and socio-economic status. This model is consistent with the Intersectionality Theory, which suggests that the intersection of an individual's multiple identities, such as income and gender identity, has an impact on an individual's experience in society, such as finding employment or accessing healthcare. Overall, an individual's health outcomes can be negatively or positively impacted based on whether or not they hold multiple marginalized identities.[6]

Transgender-specific mental health data show an increased prevalence of depression, anxiety, self-harm, and eating disorders.[4, 6, 9, 10] Studies consistently show an alarmingly high rate of suicidal ideation and attempts among transgender people. Lifetime prevalence of suicidal ideation ranges from 31% in a youth sample to 66% in a sample of veterans.[1, 11, 12] Suicide attempt rates are also elevated, from a 17% prevalence in the youth sample to 51% in veterans.[1, 11, 12]

Transgender people face multiple barriers within the healthcare system and frequently report delaying medical care due to cost, discrimination and harassment in healthcare settings, difficulty finding a healthcare provider, and denial of care.[6, 10, 13–18] Being transgender was a legally acceptable reason to be denied insurance coverage until implementation of the Affordable Care Act in 2010. Transition-related care is often treated as cosmetic or experimental by health insurance, allowing denial of services. While Medicare removed the exclusion of transgender medical and surgical therapy, many insurance plans categorically deny care related to gender transition.[19, 20] As provider training on transgender-related health issues has been lacking, the burden of teaching healthcare providers often falls on patients themselves.[14, 15, 18, 21]

As many transgender and gender-nonconforming people depend on the medical system for hormone replacement therapy, gender-confirming surgery, chronic disease management, and preventive care, understanding the health needs of this population is critical. Health outcome data for the transgender population has been identified as a research priority.[22–24] The Colorado Transgender Health Survey examines the health disparities faced by transgender and gender nonconforming people in Colorado.

METHODS

A large portion of the Colorado Transgender Health Survey (CTHS) was derived from the core sections of the Behavioral Risk Factor Surveillance System (BRFSS) to collect comparable information and address the specific health needs of the transgender community.[25] Some questions were modified to be more transgender-inclusive or to better suit the format in which the survey was administered.

To address specific needs of the transgender community, we used questions from the National Transgender Discrimination Survey (NTDS), conducted by the National Center for Transgender Equality in 2011. The NTDS did not have a health behavior focus but asked questions related to discrimination and violence towards transgender individuals. We developed additional questions to ask about transition-related care. Questions about illicit drug use were adapted from the National Survey on Drug Use and Health (NSDUH).[26] As surveillance and data monitoring fall within the usual activities of the Department of Public Health, this survey was exempt from IRB approval. This survey was voluntary, anonymous, and self-reported, and respondents could stop their participation at any time.

The CTHS included 73 questions on demographics, health behaviors, and outcomes and was in the field for 7 months in 2014. Our survey administration and recruitment methods were similar to those of the NTDS. The survey was primarily administered through an online survey tool (Survey Monkey) with paper copies upon request. The CTHS was promoted through outreach to lesbian, gay, bisexual, and transgender (LGBT)-focused organizations; LGBT-friendly physicians and mental health providers; support organizations; homeless shelters; religious organizations; and universities. Communications about survey participation were posted to Facebook, Twitter, and transgender-specific online forums. The survey was also promoted in person at the Colorado Gold Rush Conference as well as at LGBT pride festivals across the state. Multiple avenues of in-person and digital outreach were used to reach different demographics within the larger transgender community. For example, promotional materials were sent to organizations serving communities of color, younger and older adults, and individuals living in rural communities. In-person outreach at LGBT pride festivals was especially important for reaching people in rural areas of the state. In addition, participants were encouraged to pass on information to other people in their lives who may qualify to take the survey. This was done in an attempt to reach a greater number of people, specifically those who were not as strongly connected to the transgender community.

Data analysis of the CTHS was limited to respondents who identified as transgender or gender nonconforming in an initial screening question and also provided a valid Colorado zip code or indicated being homeless. All analyses of the CTHS and BRFSS were performed using SAS 9.3 (SAS Institute Inc., Cary, NC). Chi-squared tests for proportions and t tests for means were performed to test observed differences within the CTHS sample, with $p < 0.05$ considered statistically significant. Select indicators from the CTHS are presented alongside population-based estimates from BRFSS and NSDUH to facilitate interpretation of our findings compared to the general population. No formal statistical significance testing was performed for these comparisons as these were separate studies

Table 1 Demographic Characteristics and Transition-Related Care, Ages 18 and Older, 2014 CTHS and Colorado BRFSS

	Transgender respondents	All adults
Sex*	No. (%)	Weighted percent (95% CI)
Male	213 (52.5)	49.8 (48.7–51.0)
Female	190 (46.8)	50.2 (49.1–50.2)
Not reported	3 (0.7)	–
Gender identity	No. (%)	Weighted percent (95% CI)
Transgender man	94 (23.2)	–
Transgender woman	118 (29.2)	–
Transgender	18 (4.4)	–
Man	20 (4.9)	–
Woman	57 (14.0)	–
Agender	5 (1.2)	–
Gender queer/fluid	70 (17.2)	–
Other	23 (5.7)	–
Not reported	1 (0.2)	–
Sexual orientation	No. (%)	Weighted percent (95% CI)
Lesbian or gay	83 (20.4)	1.8 (1.5–2.2)
Straight	52 (12.8)	96.2 (95.6–96.7)
Queer	90 (22.2)	–
Bisexual or pansexual	136 (33.5)	1.7 (1.4–2.1)
Not sure or questioning	22 (5.4)	–
Other	21 (5.2)	0.3 (0.1–0.5)
Not reported	2 (0.5)	–
Transition-related care	*N* (%)	Weighted percent (95% CI)
Ever used HRT	395 (71.6)	–
Currently using HRT	398 (64.3)	–
Plan to use HRT in future	394 (79.2)	–
Ever had transition-related surgery	397 (27.2)	–
Race/ethnicity	No. (%)	Weighted percent (95% CI)
White, non-Hispanic	323 (79.6)	72.2 (71.1–73.3)
Black, non-Hispanic	3 (0.7)	3.8 (3.3–4.3)
Hispanic (any race)	28 (6.9)	18.6 (17.6–19.5)
Other race or multiple races	42 (10.3)	5.4 (4.6–6.0)
Not reported	10 (2.5)	–
Age	No. (%)	Weighted percent (95% CI)
18–44 years	287 (70.7)	49.2 (48.2–50.3)
35–64 years	102 (25.1)	33.7 (32.7–34.7)
65 years or older	17 (4.2)	17.0 (16.4–17.7)
Education level	No. (%)	Weighted percent (95% CI)
No diploma or GED	8 (2.0)	10.8 (9.9–11.7)
High school diploma or GED	31 (7.6)	22.9 (22.0–23.9)
Some college (1–3 years)	169 (27.1)	32.9 (31.8–34.0)
College graduate (4+ years)	193 (62.3)	33.4 (32.4–34.3)
Not reported	4 (1.0)	–
Employment status	No. (%)	Weighted percent (95% CI)
Employed	252 (62.1)	62.5 (61.5–63.6)
Unemployed	52 (12.8)	5.5 (4.9–6.1)
Homemaker	6 (1.5)	7.1 (6.5–7.6)
Student	50 (12.3)	5.2 (4.5–5.8)
Retired	22 (5.4)	15.4 (14.8–15.9)
Unable to work	24 (5.9)	4.4 (4.0–4.8)
Income	No. (%)	Weighted percent (95% CI)
Less than $25,000	164 (40.4)	23.9 (22.8–24.9)
$25,000 to $49,999	102 (25.1)	23.1 (22.1–24.1)
$50,000 or more	123 (30.3)	53.0 (51.9–54.2)
Not reported	17 (4.2)	–

No., frequency; N, sample size; –, data not available
**Represents sex at birth for CTHS respondents*

with substantial methodology differences. However, 95% confidence intervals (CI) are provided for all population-based estimates, and CTHS estimates that fall outside that range are inferred as meaningful differences between our transgender sample and the general population.

RESULTS

A total of 593 individuals participated in the survey—507 identified as transgender or gender nonconforming; 417 provided a valid Colorado zip code or were homeless. Data were further restricted to the 406 respondents ages 18 and older, to allow general comparisons to the overall adult population in Colorado as estimated by the 2014 BRFSS ($n = 13{,}399$). Nationwide estimates for illicit and non-medical prescription drug use among adults are presented from the 2014 NSDUH ($n = 67{,}901$) as comparable state-level data were not readily available in published tables.[27] Unless noted otherwise, all statements describing differences between the CTHS sample and the general population are considered meaningful (the population-based confidence interval does not include the CTHS point estimate).

Table 1 shows the demographic characteristics and transition-related care of CTHS respondents. Among survey respondents, over half identified their gender specifically as transgender men or transgender women. Nearly 20% identified as man or woman, and approximately the same percent identified as gender queer/fluid. While one respondent omitted specifying a gender identity, this individual opted into the survey as gender nonconforming and also indicated plans to use hormone replacement therapy in the future. Approximately one third of respondents reported their sexual orientation as bisexual or pansexual, 22.3% queer, and 20.5% lesbian or gay. Thirteen percent of respondents reported being heterosexual, whereas 96.2% of adults in Colorado identify as such. Over 70% of respondents had ever used hormone replacement therapy—64.3% were currently using, and 79.2% were planning to use hormones in the future. More than one in four respondents had undergone transition-related surgery.

Survey respondents were younger than the general adult population in Colorado (Table 1). More than two thirds of the sample were younger than 45 and only 4.2% were 65 and older, whereas about half of Colorado adults are younger than 45 and 17.0% are 65 and older. A much higher proportion of the transgender sample had pursued education beyond a high school degree than the average adult (90.3 and 66.3%, respectively). Despite more transgender respondents completing a 4-year college degree, rates of unemployment and household incomes under $25,000 per year were twice as high in this group.

Table 2 Select Health-Related Indicators, Ages 18 and Older, Colorado, 2014 CTHS, Colorado BRFSS, and NSDUH

	Transgender respondents	All adults
Health status	*N* (%)	Weighted percent (95% CI)
General health is fair/poor	402 (18.9)	13.2 (12.4–13.9)
	N (mean)	Mean (95% CI)
Number of days physical health not good in past 30 days	396 (5.7)	3.4 (3.2–3.5)
Number of days mental health not good in past 30 days	396 (10.5)	3.2 (3.0–3.3)
Number of days poor physical/mental health interfered with usual activities	394 (6.7)	3.9 (3.6–4.1)
Substance use	*N* (%)	Weighted percent (95% CI)
Current smoking	381 (17.3)	15.7 (14.8–16.6)
Binge drinking*	377 (25.7)	17.5 (16.5–18.4)
Current marijuana use	381 (32.8)	13.6 (12.4–14.8)
Non-medical use of prescription drugs in past year†	377 (10.6)	5.6 (5.3–5.9)
Illicit drug use in past year†	378 (9.3)	16.6 (16.1–17.1)
Mental health	*N* (%)	Weighted percent (95% CI)
Current depression	349 (43.0)	6.8 (5.5–8.1)
Ever diagnosed with anxiety disorder	384 (52.1)	15.1 (13.4–16.7)
Had serious thoughts of suicide in past year‡	383 (36.0)	3.8 (3.0–4.6)
Made a suicide attempt in past year‡	383 (10.2)	0.8 (0.4–1.2)
Health care access and utilization	*N* (%)	Weighted percent (95% CI)
Have any type of health care coverage§	396 (86.6)	87.2 (86.4.9–88.1)
Have employer-sponsored health care coverage	394 (47.0)	55.7 (54.2–57.2)
Have Medicaid coverage	394 (16.5)	10.6 (9.6–11.6)
Have Medicare coverage	394 (8.9)	20.1 (19.1–21.1)
Have a regular provider	396 (73.5)	76.2 (75.1–77.2)
Routine checkup in past 12 months	393 (64.4)	62.7 (61.6–63.8)
Delayed care due to cost in past 12 months	392 (40.8)	13.1 (12.3–14.0)
Delayed care because of fear of discrimination	360 (31.7)	–

N, sample size; –, data not available
**Binge drinking was calculated using sex at birth since the current definition is based on the gender binary*
†Data are from the 2014 National Surveys on Drug Use and Health
‡Data are from the 2009 Colorado Behavioral Risk Factor Surveillance System
§Respondents were asked about having any coverage and then to specify the type(s). Two respondents reported coverage but did not specify a type

Overall, transgender respondents reported poorer health and increased days of activity limitation (Table 2). Some of the largest disparities faced by transgender respondents are seen in substance use and mental health. Suicidal thoughts and suicide attempts were ten times higher in the CTHS sample than in the Colorado adult population in 2009 (most recent BRFSS data available). This result is foreshadowed by the fact that current depression, as well as a lifetime diagnosis of an anxiety disorder, was higher in the CTHS sample than in Colorado adults overall.

Current substance use was also elevated among the transgender sample (Table 2). Nearly one third of transgender respondents reported using marijuana and one-fourth reported binge drinking in the past 30 days. Cigarette smoking was only slightly higher in the CTHS sample. Ten percent of CTHS respondents reported non-medical use of prescriptions and 9.3% reported illicit drug use in the past year. Data from the 2014 NSDUH shows that 5.6% of adults nationwide used prescription drugs for non-medical use and 16.6% used illicit drugs in the past year.[27]

The proportion of individuals with any type of health care coverage was comparable between the CTHS sample (86.6%) and adult Coloradans (87.2%) (Table 2). However, fewer transgender respondents had employer-sponsored coverage (47.0 versus 55.7%) and a greater proportion had Medicaid (16.5 versus 10.6%). Additionally, Medicare coverage was less than half of the general population. These differences are congruent with the CTHS sample being younger with higher rates of unemployment and poverty. Though overall insurance coverage rates were comparable, fewer transgender respondents reported having a regular health care provider and were more than three times more likely to delay care due to cost in the past year. Additionally, 23.1% of respondents delayed care due to an issue with insurance or services not covered by their plan. Thirty-one percent of respondents delayed needed care out of fear of discrimination. These barriers aside, a higher proportion of transgender respondents (64.4 versus 62.7%) received a routine checkup within the past year.

The CTHS asked if respondents felt the healthcare provider they see most regularly provides transgender "inclusive" health care, and why they felt that was the case (Table 3). A majority of respondents felt that they have an inclusive provider, but over one-third disagreed. Those with an inclusive provider were more likely to report that their provider was knowledgeable about and able to address transgender-specific health care needs. A large portion of both groups indicated their provider was comfortable with transgender patients, but this was less common among those without an inclusive provider. Responses from both groups indicated improvements could be

Table 3 Health Care Provider Experiences and Health Outcomes, Ages 18 and Older, Colorado, 2014 CTHS

	Perceive provider as transgender inclusive	Do not perceive provider as transgender inclusive	
Total*	239 (61.6)	149 (38.4)	
Provider characteristics	*N* (%)	*N* (%)	*p* value†
Knowledgeable about transgender health	238 (76.1)	148 (41.9)	< 0.0001
Comfortable with transgender patients	238 (88.2)	148 (70.9)	< 0.0001
Addresses transgender-specific medical needs	238 (76.9)	148 (50.0)	< 0.0001
Office is welcoming to transgender patients	238 (69.7)	148 (68.2)	0.7556
Has transgender-inclusive policies and forms	238 (52.9)	148 (54.7)	0.7319
Health care	*N* (%)	*N* (%)	*p* value†
Routine checkup in past 12 months	236 (75.0)	147 (48.3)	< 0.0001
Delayed care because of fear of discrimination	213 (23.9)	138 (42.8)	0.0002
Mental health	*N* (%)	*N* (%)	*p* value†
Current depression	212 (36.8)	147 (53.1)	0.0031
Had serious thoughts of suicide in past year	231 (29.0)	142 (47.2)	0.0004
Made a suicide attempt in past year	231 (7.4)	142 (15.5)	0.0127
Quality of life	*N* (%)	*N* (%)	*p* value†
General health is fair/poor	239 (15.5)	148 (26.4)	0.0089
Unhealthy days	*N* (mean)	*N* (mean)	*p* value†
Number of days physical health not good in past 30 days	237 (6.3)	149 (7.4)	0.2377
Number of days mental health not good in past 30 days	237 (10.6)	149 (13.2)	0.0203
Number of days poor physical/mental health interfered with usual activities	235 (6.4)	148 (9.8)	0.0003

N, sample size
**Respondents could select multiple characteristics and quality of life indicators. Totals do not add to 100%*
†p values from chi-squared tests for proportions and t tests for means

made in the area of office policies and forms, with only about half of either group indicating that current policies and forms were transgender-inclusive.

Perceiving a provider as inclusive was associated with healthcare utilization and overall health. Those without an inclusive provider were almost twice as likely to delay care because of fear of discrimination (42.8 versus 23.9%) and less likely to have received annual routine exam within the past year (48.3 versus 75.0%). They were also more likely to be currently depressed (53.1 versus 36.8%), to have suicidal thoughts (47.2 versus 29.0%), and to have made a suicide attempt in the past year (15.5 versus 7.4%). Having an inclusive provider was associated with lower rates of fair or poor overall health (15.5 versus 26.4%) and number of days of poor mental health in the past month (10.6 versus 13.2). Despite the protective associations of having an inclusive provider, the prevalence of these negative health outcomes is still higher compared to the Colorado adult population.

DISCUSSION

The Colorado Transgender Health Survey is the largest statewide transgender health dataset to date. These data show significant barriers and health disparities, especially around mental health. The survey parallels national public health data collection, allowing a comprehensive look at the health behaviors and outcomes of transgender people in a way that traditional surveillance does not capture. In addition, these data highlight the positive association of transgender-inclusive providers on physical and mental health.

The Colorado Transgender Health Survey was cross-sectional. Inferences about the directionality of associations cannot be made based on these data. Other limitations of this survey relate to the inability to randomly sample the transgender population. Statistical comparison between our data and BRFSS data was not possible. Our sample was skewed towards people who are connected to the transgender community in some way, excluding people who are not open about their gender identity or engaged with the transgender community. Despite our efforts to connect with transgender groups in rural parts of the state through online and in-person outreach, our sample is predominantly urban. Connections were made with institutions working with communities of color. However, even with targeted outreach, our sample was predominately White. In addition, our survey was web based, which may have biased the sample towards younger people, those with internet access, and those with higher household incomes who are not institutionalized. This limits the comparisons that can be made to general population data, as well as overall generalizability of our study. Marijuana and illicit drugs use rates may be impacted by the statewide legalization of recreational marijuana. We used data from BRFSS (marijuana) and NSDUH (illicit/prescription drugs) from the same time period as CTHS to minimize any impact of underreporting (prior to and around the time of legalization).

Despite these limitations, our results mirror the social disparities seen in other studies and are consistent with the Minority Stress Model.[6, 7, 9, 18, 28–30] Despite having higher levels of education compared to the general population, 13% of our sample reported being unemployed and 42% reported an annual income less than $24,000. These are comparable to the 2015

US Transgender Survey where 16% of respondents were unemployed and 55% reported annual incomes less than $24,000.[6] In our study, 40% of respondents delayed seeking healthcare when needed compared to 16% in the general population—cost and fear of discrimination were the two most common reasons cited. This data aligns with other studies demonstrating that discrimination experiences in general and fear of discrimination impact patients accessing healthcare.[13, 16, 31, 32] Delays in accessing healthcare have been associated with poorer health outcomes.[31]

Our study also highlights the continued mental health crisis in the transgender population. Consistent with other studies,[6, 10, 12] 36% of our sample had contemplated suicide and 10% made an attempt in the past year, compared to 4 and 1%, respectively, in the general Colorado population. Providers should ensure to screen for and address mental health issues for all transgender and gender-nonconforming patients. Public health programming should include interventions specifically targeting this population.

We found that access to a transgender-inclusive provider may partially mitigate these mental health disparities, as it is associated with lower rates of depression, suicidal ideation, and suicide attempts. The most prominent factors associated with a perception of being transgender-inclusive were knowledge about transgender health, addressing transgender-specific health needs, and being comfortable with transgender patients. This aligns with other studies that have found that increased support, provider knowledge about transgender issues, and access to transition-related care improve mental health.[7, 30, 32]

Provider training may be one component of a multi-pronged strategy for improving the health of transgender patients. The Veterans Affairs conducted a multi-site provider training that demonstrated the feasibility of implementing training programs, increased provider self-confidence, and intent to treat more transgender patients.[33] Other trainings have demonstrated similar improvements in provider knowledge and self-confidence.[34–36] However, clinical outcomes of these training programs are lacking. Furthermore, it is unknown to what extent providing access to a transgender-inclusive provider can mitigate the minority stress experienced by this population and improve health outcomes.

Our study highlighted mental health as a key priority—additional research to determine effective interventions is crucial. Recognizing that access to transgender-inclusive providers is associated with improved health is one step. However, we need additional information on which specific provider behaviors demonstrate "inclusion" and outcomes-based evaluations of provider and system targeted trainings. The CTHS demonstrates the critical importance of ongoing statewide and national data collection to understand the factors impacting the health of our transgender population. Studies should be completed at the population level to allow for direct comparisons on risk behaviors and health outcomes and to evaluate the impact of our interventions.

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Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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